

Describing & Explaining shapes and polarity (Level 3) examiners tips: Read these please!

To describe and explain **shape of a molecule** you must state, describe and explain the following in your answer

- firstly, locate and name the central atom
- state the number of regions of negative charge (or electron repulsion) around the central atom
- describe the number of bonding pairs and lone pairs around this central atom
- these (insert number of) regions of negative charge (or electron density) repel each other as far apart as possible
(*you absolutely must refer to those repulsions*)
- state the shape and bond angles

To describe and explain **polarity of a molecule** you must state, describe and explain the following in your answer

- **1st**: state whether the molecule does or does not contain “polar bond(s)”

NO polar bond(s); “the atoms in the molecule have the same electronegativity, which means the pair of electrons in each covalent bond are attracted equally to both atoms”

YES polar bond(s); then describe the bond polarity in terms of the difference in “electronegativity” of the atoms in the molecule, indicate with a δ^- and δ^+ sign on the relevant atoms, state *eg. within a water molecule, the O atom is δ^- (dipole negative) because O is more electronegative than H, so the H atoms are δ^+ (dipole positive). A higher electronegativity means that the pair of electrons in each covalent bond are more strongly attracted to the O atom compared to the H atom.*

- **2nd**: looking at the central atom state the “shape” and number of “lone pairs” (if any) of the molecule
- **3rd**: whether the molecule has a “symmetrical distribution of charge” or not as the case may be
- **4th**: describe whether the bond dipoles or polar covalent bonds “cancel” or “do not cancel”
- **finally**...an overall statement re polarity of the molecule...

eg “Non-polar molecules have no dipole or polar bond present in the molecule or the spread of charge is even”

eg. “Molecules are polar if there is an uneven distribution of charge within the molecule”

To achieve with an Excellence in this answer you must discuss fully the factors that affect the shape and polarity of molecules

Also...”don’t be daft”, what NOT to do

don’t write about maximum repulsion, write in terms of MINIMUM repulsion between pairs of electrons